

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 2, 2019/2020

DOS5311 – OPERATING SYSTEMS (DIT)

28 FEBRUARY 2020
3.00 p.m. – 5.00 p.m.
(2 Hours)

INSTRUCTIONS TO STUDENT

1. This question paper consists of 4 pages.
2. Answer ALL questions.
3. Write your answers in the answer booklet provided.

Structured Questions, 4 Questions (Total: 40 Marks)

Instruction: Answer *ALL* the questions in the Answer Booklet provided.

QUESTION 1

- a) Describe **TWO** differences between symmetric multiprocessing and asymmetric multiprocessing. (4 Marks)
- b) Given the memory layout as below, determine the base registers and limit registers for Job B and Job D. (2 Marks)

0	Monitor
16260	Job A
34369	Job B
78269	Job C
99200	Job D
126324	

- c) List and explain **TWO** benefits of using Microkernel. (4 Marks)

[TOTAL: 10 Marks]

Continued...

QUESTION 2

- a) Consider the following set of processes in **Table 1** with the length of the CPU-burst time given in milliseconds. The processes arrived according the arrival time.

Process	Arrival Time (ms)	Burst Time (ms)	Priority
P ₁	0	4	1
P ₂	2	5	3
P ₃	2	4	1
P ₄	3	3	2
P ₅	5	6	3

Table 1

Draw Gantt Charts illustrating the execution of these processes using the following scheduling algorithms. Calculate the *waiting time* for each process and the *average waiting time* for the scheduling algorithms.

- Non-Preemptive Priority. (4 Marks)
- Round Robin (Quantum=3) (6 Marks)

[TOTAL: 10 Marks]

Continued...

QUESTION 3

Consider a system with **five** processes P_1 , P_2 , P_3 , P_4 and P_5 and **three** resource types:

Printer (16 instances), Disk Drive (16 instances), Scanner (12 instances).

	Printer		Disk Drive		Scanner	
	Max	Allocation	Max	Allocation	Max	Allocation
P_1	3	2	3	2	7	3
P_2	4	1	8	4	2	0
P_3	8	7	17	3	9	1
P_4	2	2	5	4	7	6

Table 2

Available		
Resource X	Resource Y	Resource Z
4	3	2

Table 3

- Based on the requirements, current allocations and available resources given in **Table 2** and **Table 3**, determine the content of the matrix *Need*. (3 marks)
- Determine whether the system is in a safe state. Justify your answer.
(Hints: If it is in a safe state, give a safe order of execution using Banker's algorithm. If it is not a safe state, explain why it is not) (7 marks)

[TOTAL: 10 Marks]

Continued...

QUESTION 4

a) Explain how **First Fit** in Dynamic Partitioning Placement Algorithm work. (2 marks)

b) Consider the following page reference string:

a b, c, d, a, e, c, f, a, b, a, c, e, b, d
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Assuming a paging scheme with **FOUR** frames is initially empty. Trace the allocation of pages to frames and determine the number of *page faults* occur using the following page replacement algorithms:

- i. Least Recently Used (LRU) (4 Marks)
- ii. First-In-First-Out (FIFO) (4 Marks)

[TOTAL: 10 Marks]

End of Page.

